RCRA Hazardous Waste e-Manifest Roadmap Overview

May 19, 2004

EPA Office of Solid Waste

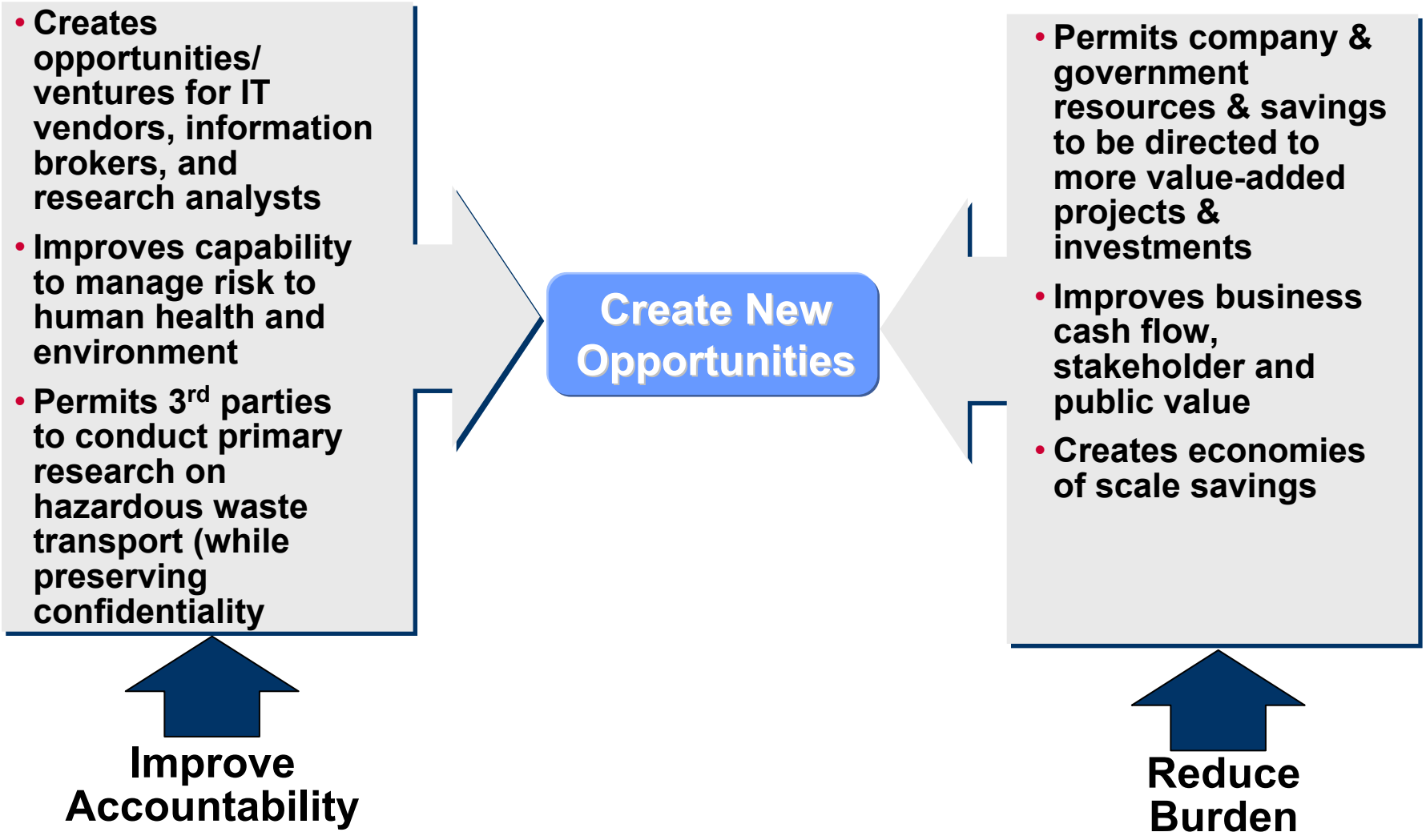
Manifest Context

- Commercial record of services performed and invoiced by handlers (B2B)
- Regulatory record of waste movement and quantities (B2G)
- Addresses Department of Transportation (DOT) requirements to identify contents and hazards of Hazmat
- Addresses RCRA requirements for a routing document
- Addresses state environmental agency requirements
- Annual workload of 2.2M-5.0M HW manifest transactions
- 146,000 HW manifest customers
- National HW manifest paperwork burden costs $193 million to $595 million per year (industry + state governments)

e-Manifest Key Assumptions

- e-Manifest will be optional for users
- Use of some paper manifests will continue
- Will adopt Office of Solid Waste's (OSW's) standardized HWM data elements
- Will support the "core functions" of the RCRA manifest process
- Will define one standard schema for all e-Manifests
- If Federal solution, then must conform to Federal IT investment requirements

e-Manifest Benefits



e-Manifest Benefits

Improves Accountability and Management of Hazardous Waste

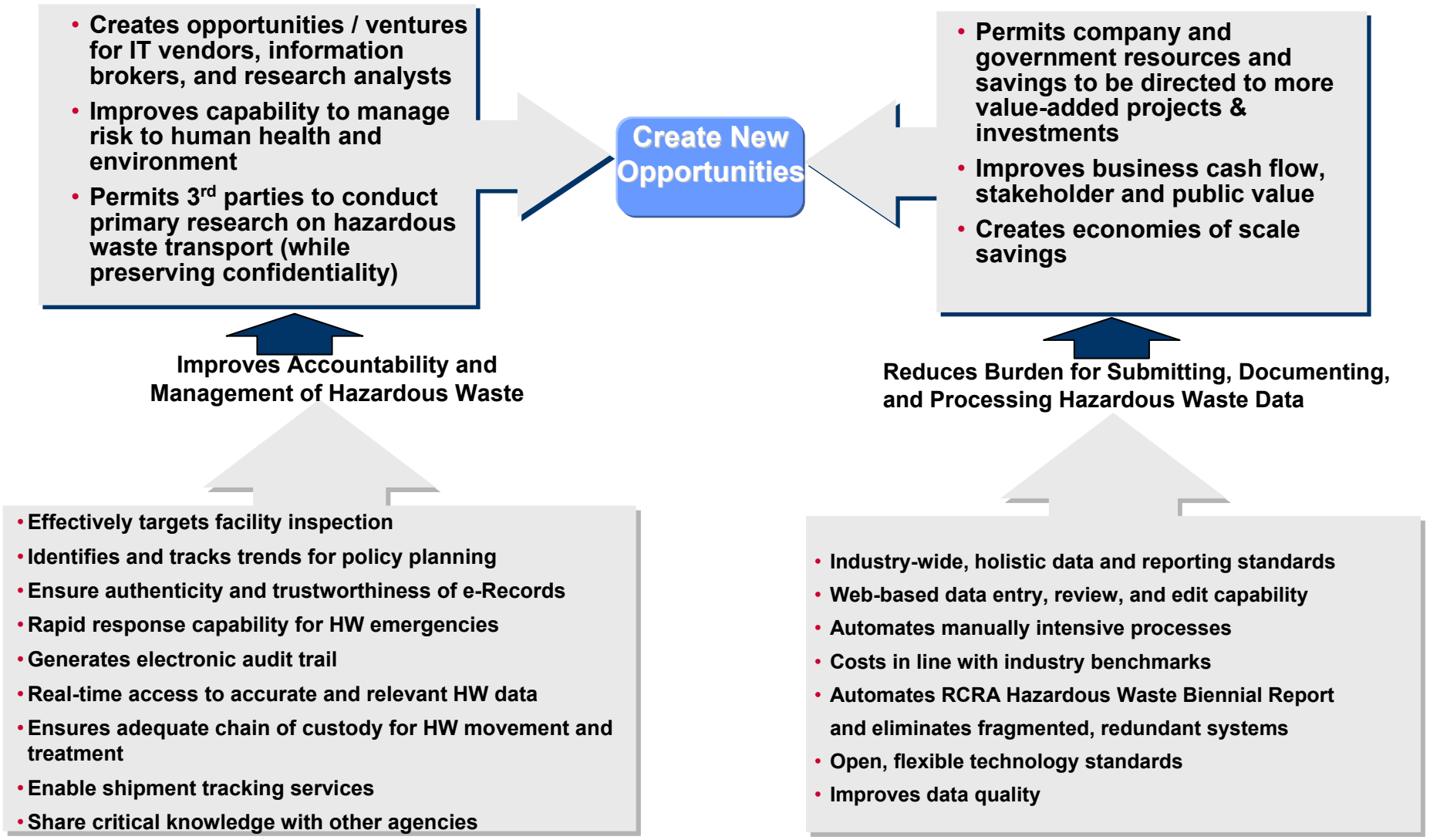
- Effectively targets facility inspection
- Identifies and tracks trends for policy planning
- Ensure authenticity and trustworthiness of e-Records
- Rapid response capability for HW emergencies
- Generates electronic audit trail
- Real-time access to accurate and relevant HW data
- Ensures adequate chain of custody for HW movement and treatment
- Enable shipment tracking services
- Share critical knowledge with other agencies

e-Manifest Benefits

Reduces Burden for Submitting, Documenting, and Processing Hazardous Waste Data

- Industry-wide, holistic data and reporting standards
- Web-based data entry, review, and edit capability
- Automates manually intensive processes
- Costs in line with industry benchmarks
- Automates RCRA Hazardous Waste Biennial Report and eliminates fragmented, redundant systems
- Open, flexible technology standards
- Improves data quality

e-Manifest Benefits



Barriers to the e-Manifest

- Funding and management support for system build and future maintenance
- Identity and signature management methods, including privacy and confidential business information (CBI)
- Integration with legacy and future IT investments, including paper
- Doubts about host's capability to maintain a centralized 24x7 system operation, backup, and customer support
- Doubts about capability to develop interoperable (integrate-able) and enforceable decentralized IT systems
- Melding B2B business mode (manifest predominantly business-to-business transmission) with B2G government mode (manifest is regulatory requirement and official record of compliance)

Conference Purpose: Collect Feedback and Drive Decisions

Level 1 Decisions:

1. **Are we ready for an e-Manifest?**
2. **What services or features are essential for an e-Manifest solution to work?**
3. **Would we build one e-Manifest IT system, multiple integrated e-Manifest IT systems, or a hybrid of both?**
4. **Will the e-Manifest use an open non-proprietary architecture?**

Level 2 Decisions:

1. **Who hosts the e-Manifest services?**
2. **Who governs the e-Manifest?**
3. **Who funds the e-Manifest?**
4. **What is the funding approach? (user fee, share-in-savings, budget line item, etc.)**

Proposed e-Manifest (May 2001)

- The May 2001 NPR proposed standards in three areas:
  - Standard electronic formats (EDI and XML),
  - Electronic Signature options (digit**al** and digit**ized**)
  - Computer security controls to enhance document integrity
- Assumptions for 2001 Proposal:
  - EPA would not collect e-Manifests
  - Private sector would develop e-Manifest systems (self-interest)
  - e-Manifest optional but advantageous for users
- Commenters criticized the proposed approach:
  - Inconsistent, private "niche" systems could result in systems that can't communicate with one another
  - Waste industry reluctant to invest, not cost-effective
  - Rigor of the standards
- We followed-up by analyzing alternative architectures, cost/benefit implications, and interoperability issues

Who is Interested in an e-Manifest?

Commercial Interests:

Focus on Front-End

- Maintain record of waste movement and quantities
- Document chain of custody
- Document accurate information bearing on performance of legal obligations, regulatory compliance, entitlement to payment
- Transmitting and collecting other commercially useful information

Government Interests:

Focus on Back-End

- More timely and accurate collection of manifest copies
- Ability to more readily populate database
- Ability to analyze waste data on manifests for Program Management, fee collection and enforcement
- Ensuring authenticity, data integrity, and enforceability of records
- Ensuring only authorized facilities and transporters handle hazardous waste

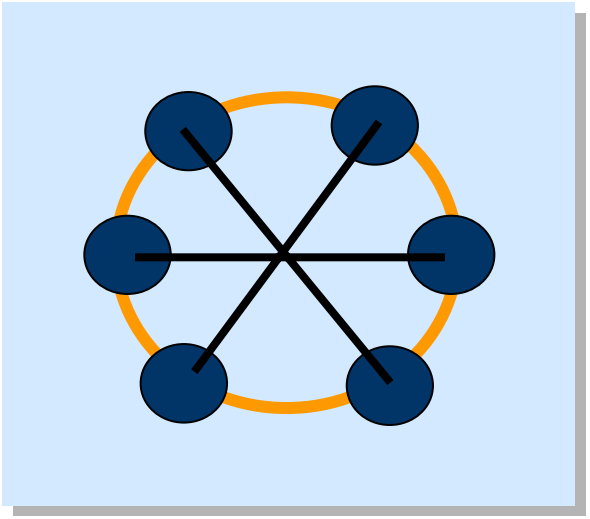
Shared Interests:

- Timely notification of shipment discrepancies, exceptions and emergencies
- Using data one time to satisfy both manifest and biennial report requirements

Proposed e-Manifest Architecture Options

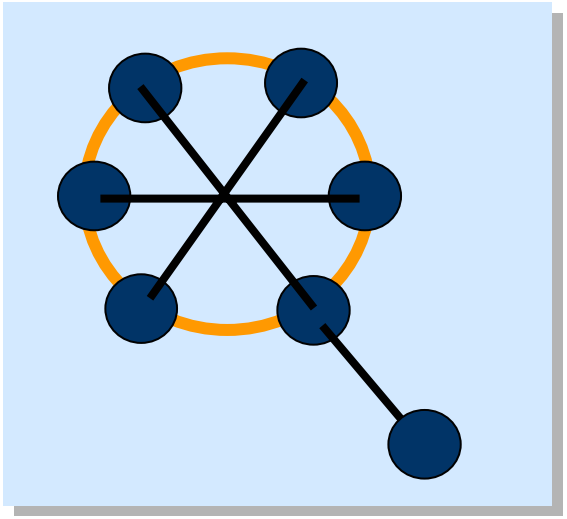
Architecture and Evaluation

Option A



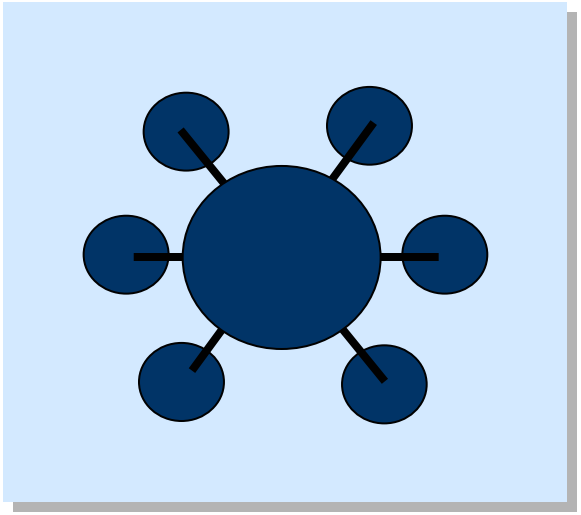
Decentralized (2001 Proposed Rule Model)

Option B



Decentralized (Collect Manifests From TSDF)

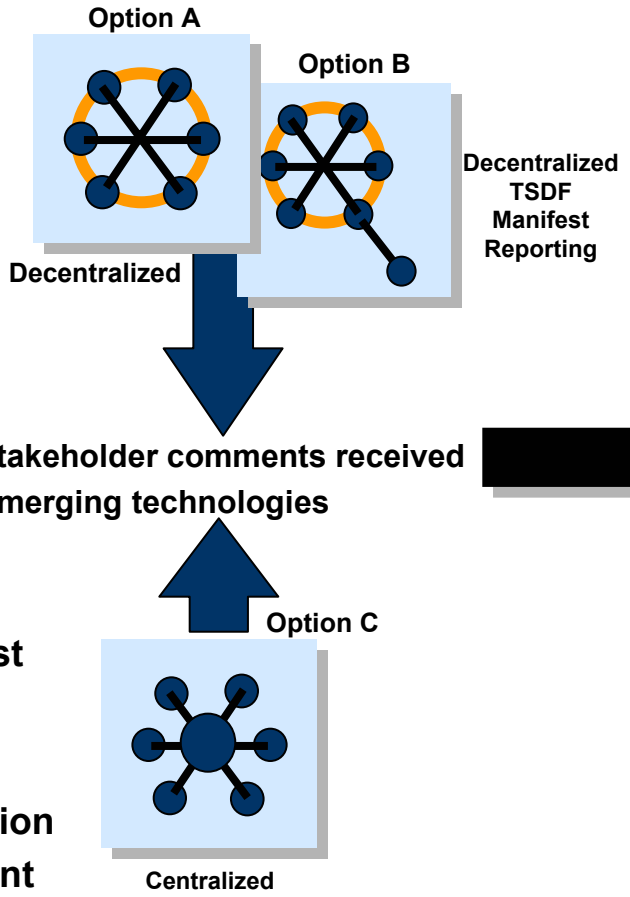
Option C



Centralized

Developing the Roadmap Straw Approach

- No single stakeholder bears a disproportionate share of cost
- Significant complexity to ensure manifest integrity, security, and non-repudiation
- Encourages stakeholder participation in provisioning services and publishing data



Shared: Manifest handling services and manifest documents are hosted on a primary network location. All other services and data may be hosted by any network partner.

Option D

Shared Manifest Clearing
Centrally Located Support
Distributed Services

- High percentage of the cost born by primary network location
- Discourages value-added services and data publication
- Least complex to implement

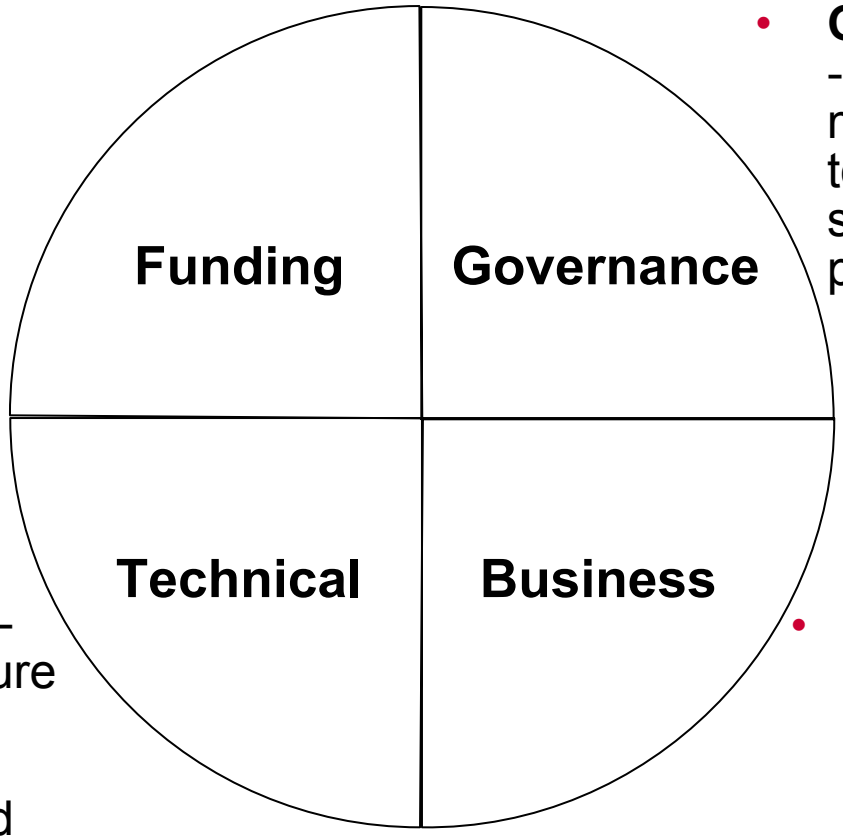
- Moderate percentage of the cost born by primary network location initially
- Ensures manifest integrity, security, and with low complexity
- Encourages stakeholder participation in provisioning services and publishing data

Intent of e-Manifest Roadmap

- ***What is the Roadmap?***
  - **Building on our May 2001 e-Manifest proposed rule, the Roadmap is a straw approach and high-level design to be used as discussion document**
- ***What is the intent of the Roadmap?***
  - **Chart a path and critical steps toward a feasible solution**
  - **Provide an agenda and platform for this conference**
  - **Facilitate stakeholder input and consensus building**
  - **Serve as a guide beyond this conference for future decisions**

What Is Included in the Roadmap?

- **Funding Approaches** - Alternatives for funding the e-Manifest system build and its operations

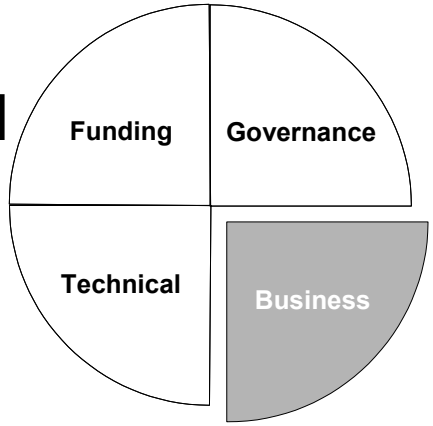


- **Governance View** - Suggestions for managing change to the e-Manifest system and process

- **Technical View** - Overall architecture and direction for data, security, infrastructure and operations

- **Business View** - Context, process, information requirements, and services views

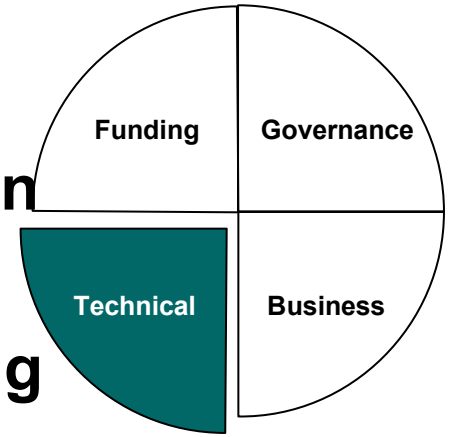
Business View



- **Context View: Key business background related to HWM**
- **Process View: Key steps, information flows, and stakeholder roles throughout HWM lifecycle**
- **Information Requirements View: Description of the information needed to fulfill reporting requirements and to improve business operations related to the UHWM**
- **Services View: Key services offered by an e-Manifest solution, and how they interrelate**

Information Technology View

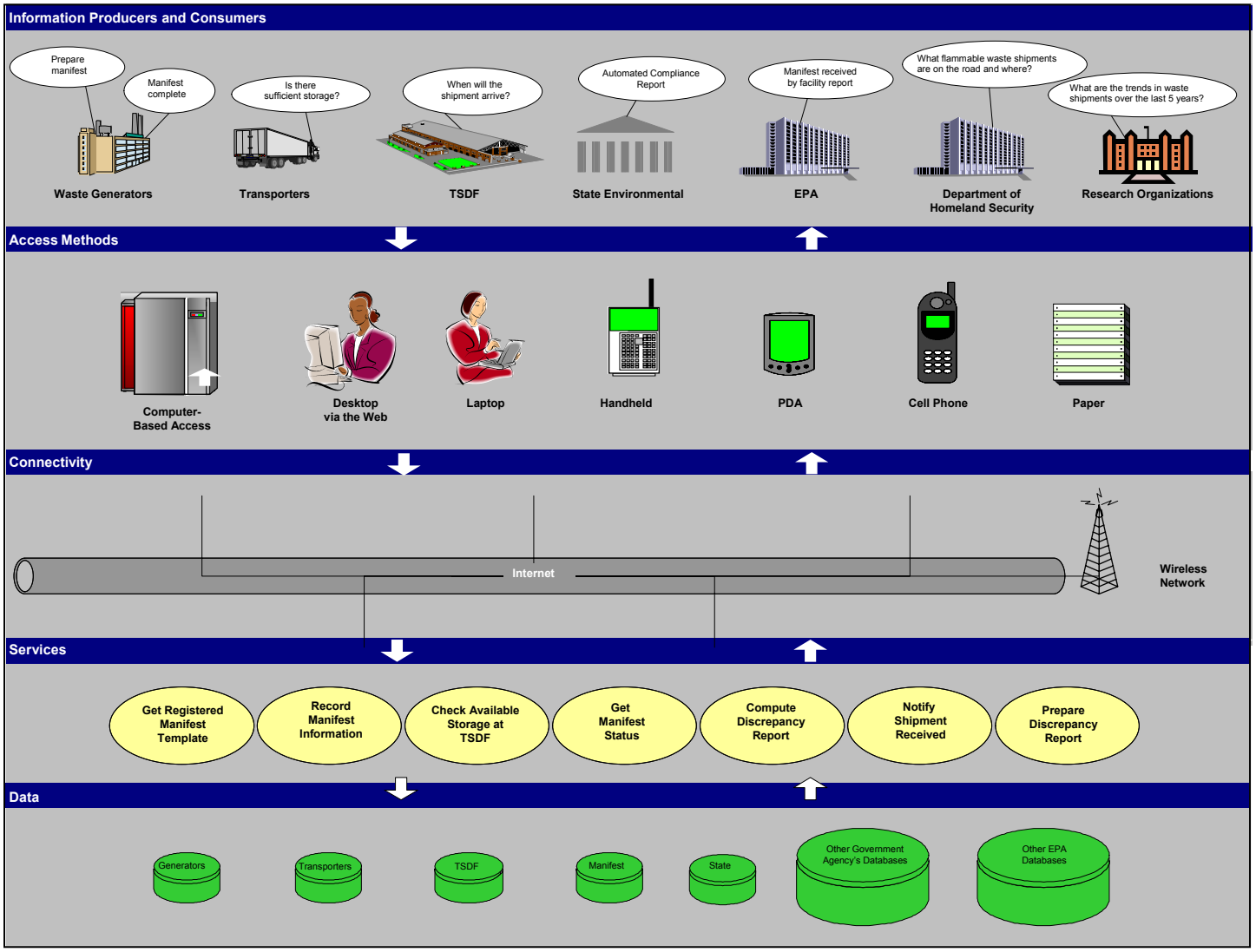
- **Architecture:** Basic structure of an e-Manifest solution and high-level design options for implementation
- **Data:** Structuring, sharing, and managing e-Manifest data
- **Security:** Keeping e-Manifest data and applications secure and private
- **Infrastructure:** Getting online with the e-Manifest solution
- **Operations:** Management of the e-Manifest solution



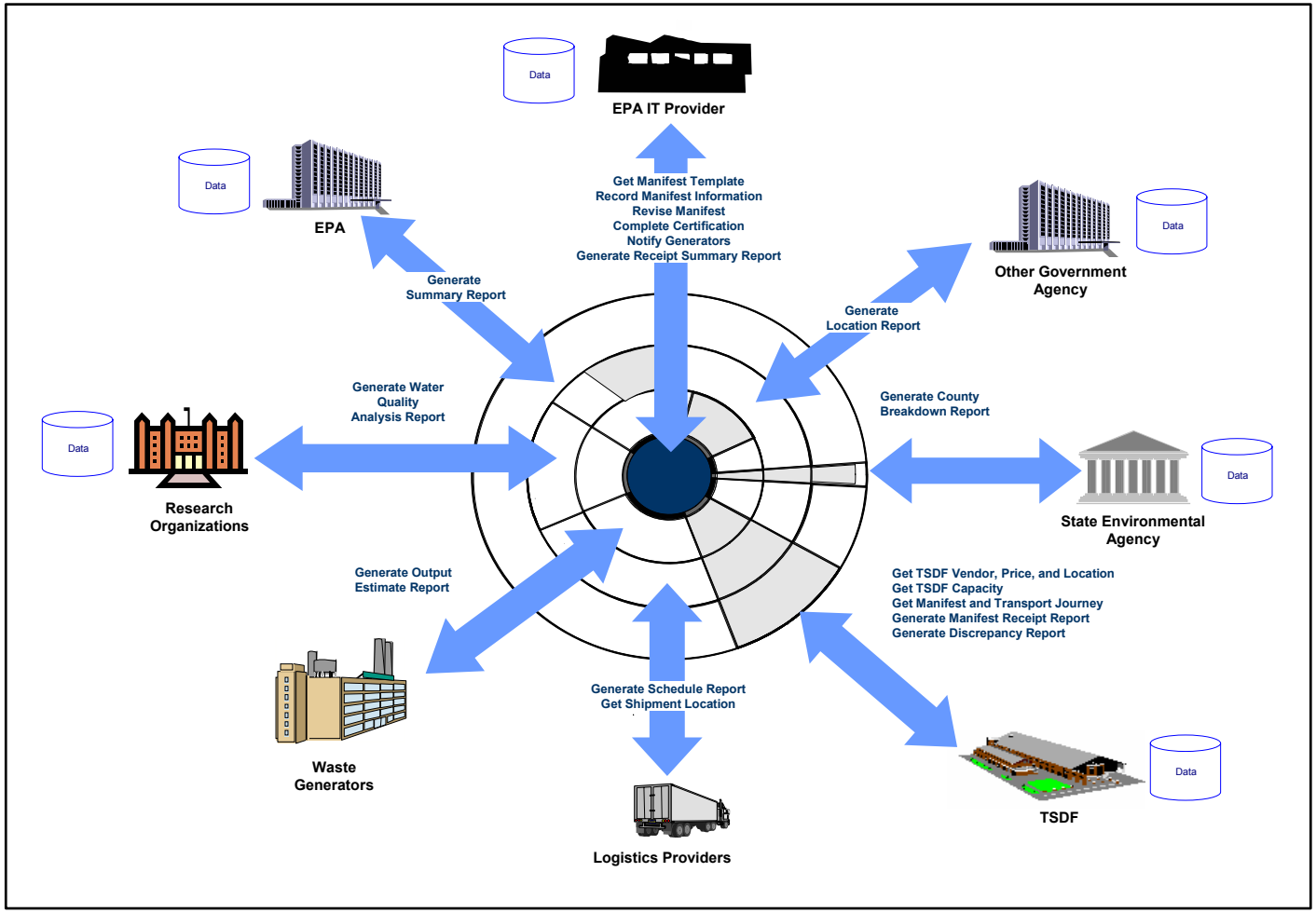
Key System Requirements

- The technical design should satisfy the following key requirements:
  - Core functions highly secure and support audit trail
  - Partners and stakeholders empowered to provide value-added services
  - Internet leveraged to ensure ease of access
  - Open industry standards used, where practicable
  - Exchange formats will be standardized
  - Legacy integration to protect partner investments

e-Manifest Conceptual View



e-Manifest Straw Approach: Shared Model

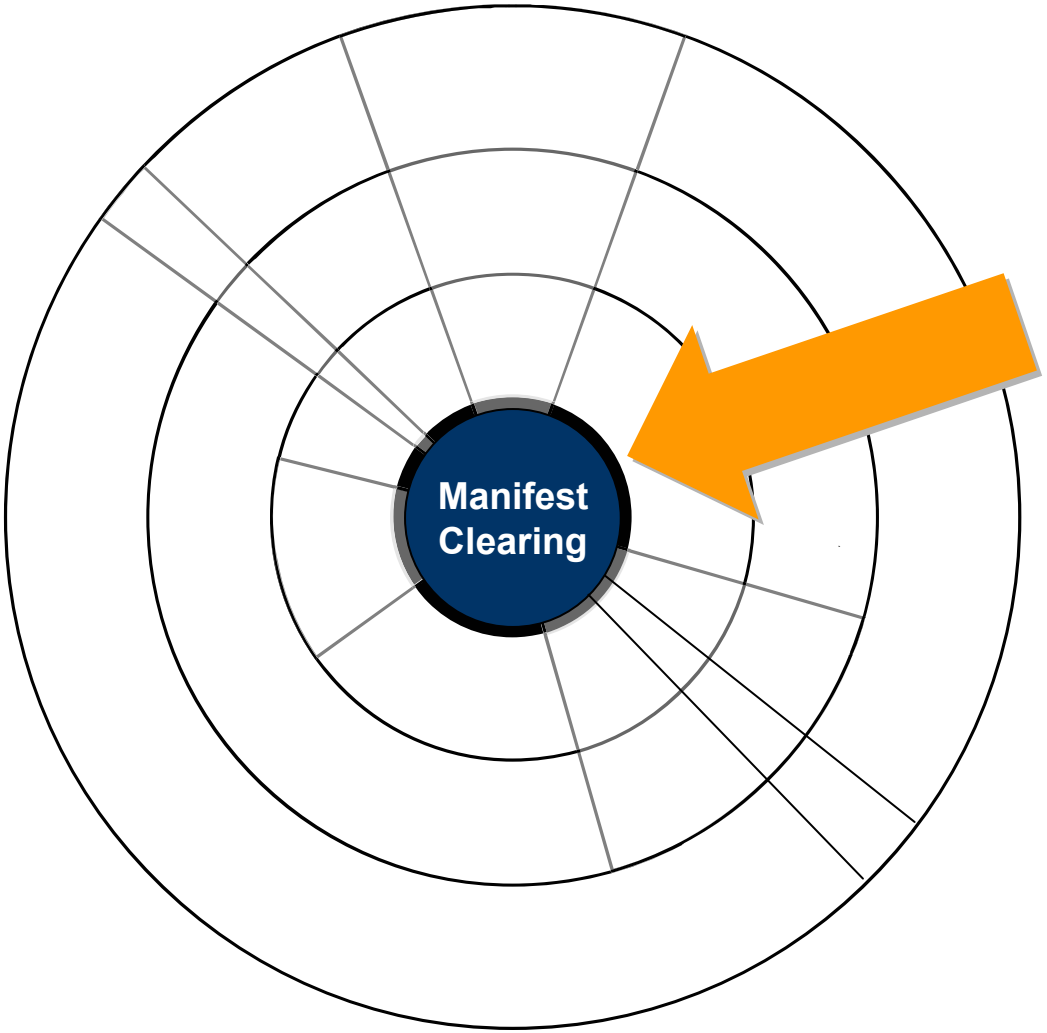


- Moderate percentage of the cost born by primary network location initially
- Ensures manifest integrity, security, and non-repudiation with low complexity
- Encourages stakeholder participation in provisioning services and publishing data

Services Model

- Services are business functions provided by the e-Manifest solution
- A services model is a conceptual model showing the types of services that may be offered
  - How they interface with key stakeholders
  - How they interrelate to one another
  - Who provides each service

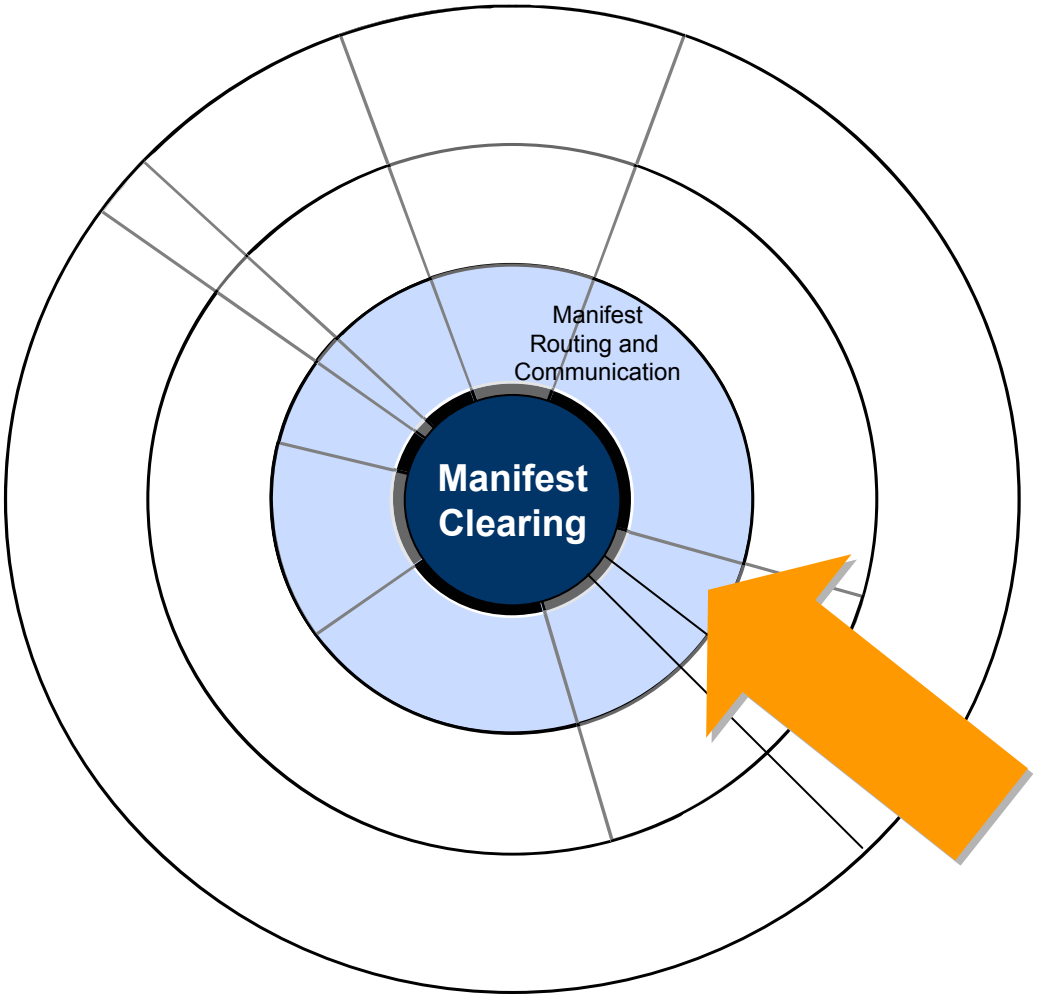
Layered Services Model



Level 1. Core Manifest Clearing and Certification:

- Required for all valid e-Manifests (all other service layers are optional)
- Allows authorized users to create, update, sign, handoff (through a simple standard workflow) and close manifests
- “System of record" for determining and enforcing legal status of the e-Manifest
- Government (EPA) is proposing it be responsible for the operation of this system (directly or through an agent)
- Integrity, protection from tampering and audit trail are key requirements of these core services

Layered Services Model

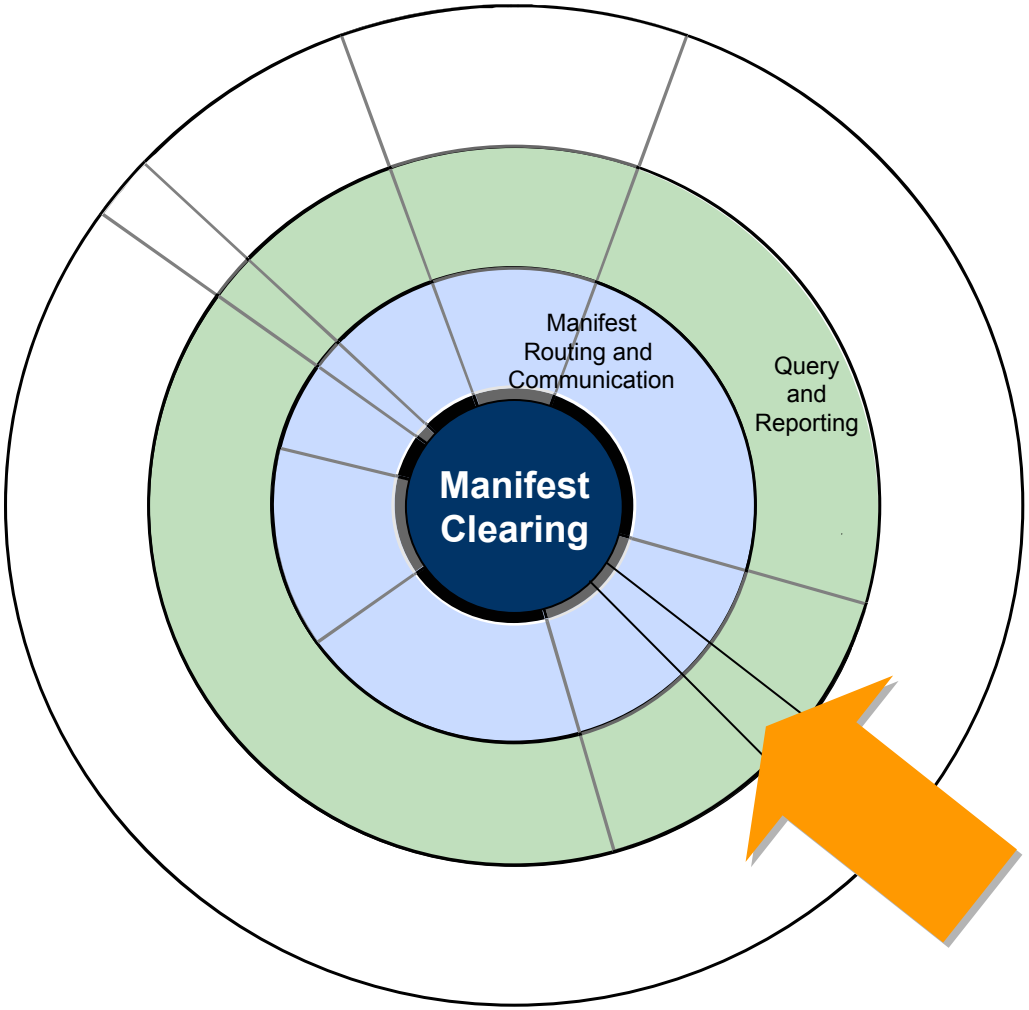


Level 1. Core Manifest Clearing and Certification

Level 2. Manifest Routing and Communication:

- Uses Level 1 core services to support basic routing and communication functions to help users process their manifests (e.g. alert users that a manifest is at a given status, flag problems, and/or provide e-copies of manifest at specific points to specified users)
- Does NOT include advanced workflow or business integration function provided by outer layers
- EPA may be responsible for some portion of these services (to support/encourage use of the e-Manifest) but other parties may also provide these (or higher level) services.

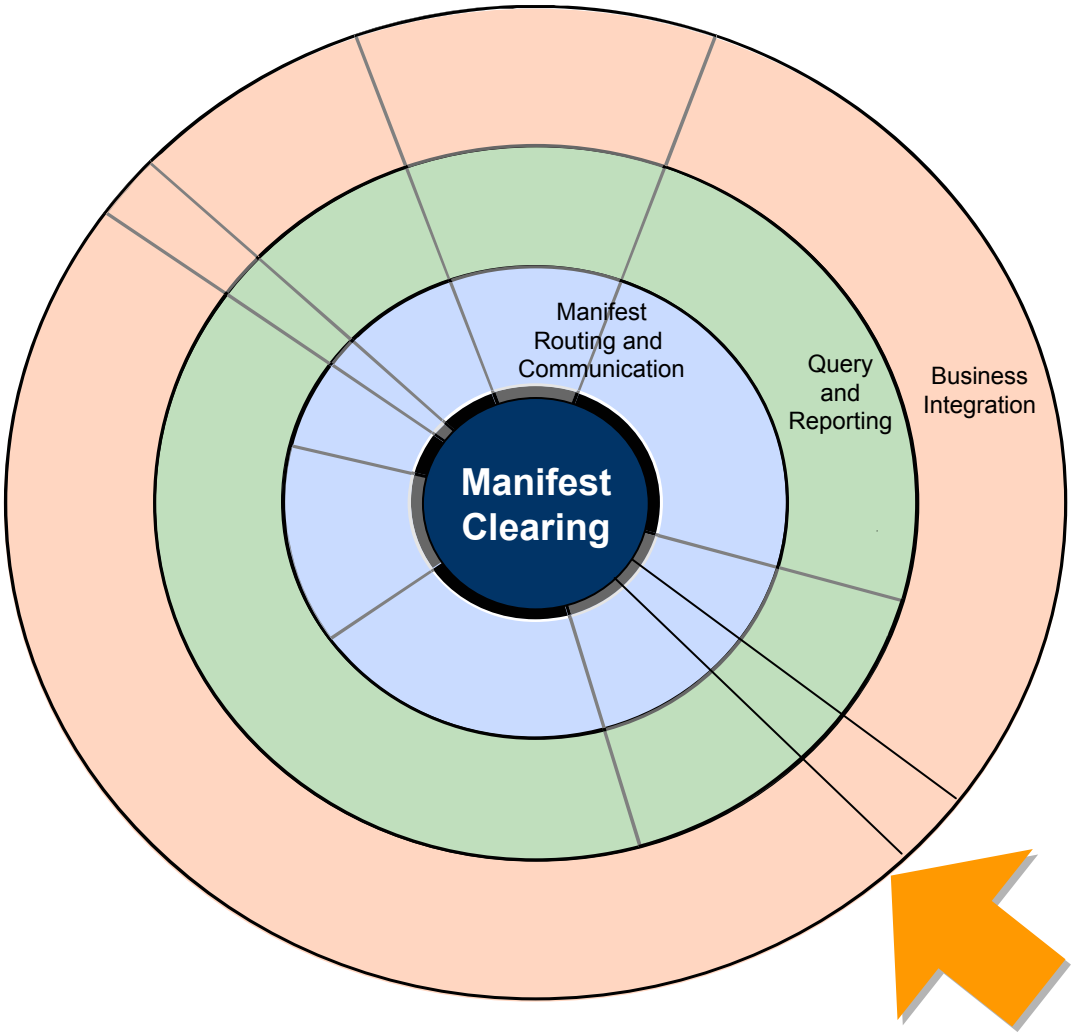
Layered Services Model



- Level 1. Core Manifest Clearing
- Level 2. Manifest Routing and Communication
- **Level 3. Query and Reporting**

- Basic and enhanced data access, query and reporting services
- Examples include simple summary reporting or real time reporting of manifests status
- Providers of Level 4 services may use these to combine manifest reporting with other data like inventory or capacity
- Provided by any stakeholder who has capability to do so

Layered Services Model

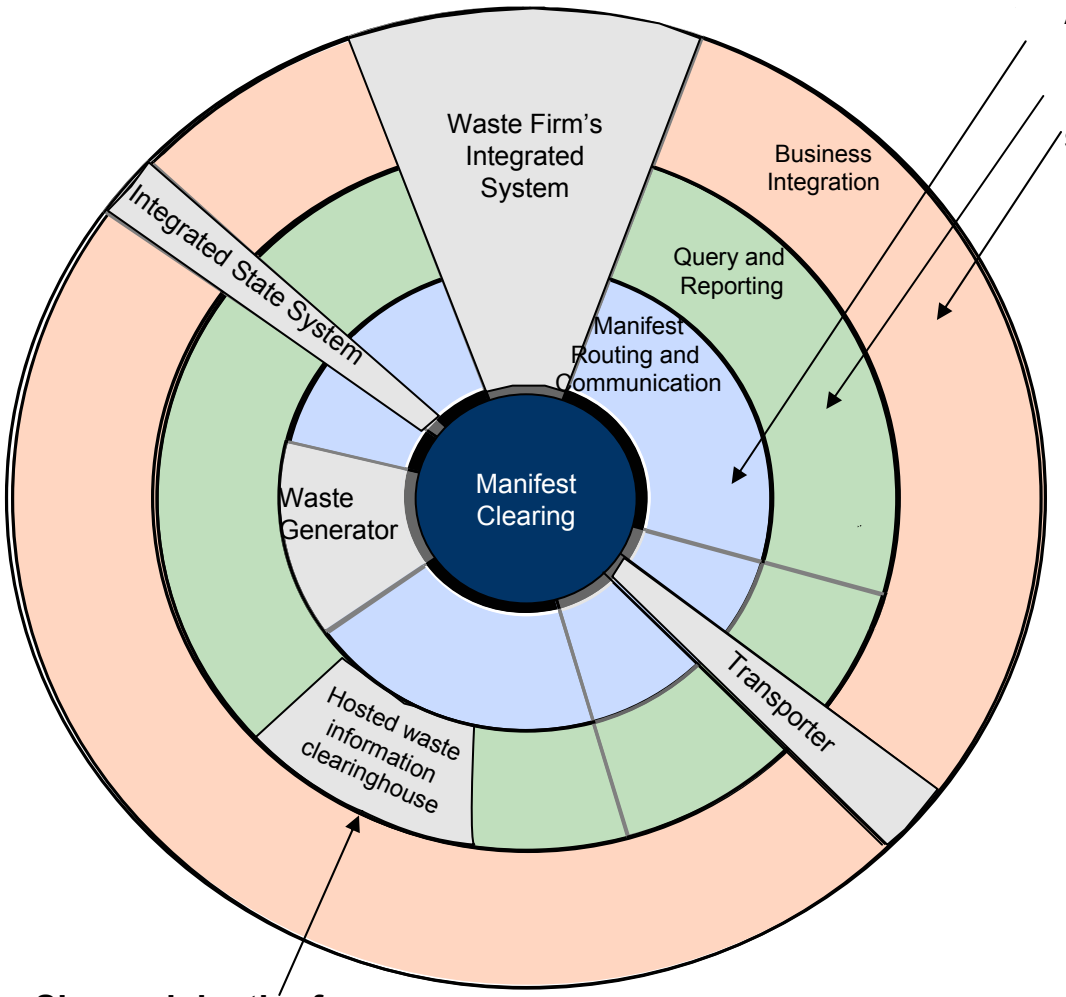


- Level 1. Core Manifest Clearing
- Level 2. Manifest Routing and Communication
- Level 3. Query and Reporting
- **Level 4. Business Integration**

-Any service a provider wishes to host, including supporting advanced query and reporting, data mining, fee schedules, inventory control, ERP and other sophisticated, business level information and workflow needs

-Provided by any stakeholder who has capability to do so

Layered Services Model

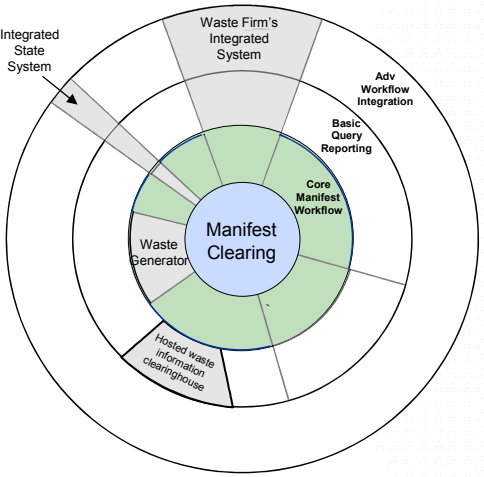


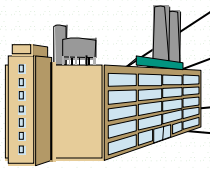
As services move from inner rings to outer rings, the number of potential providers increases, and we move from core data to supplementary views of data

- **Level 1. Core Manifest Clearing**
- **Level 2. Manifest Routing and Communication**
- **Level 3. Query and Reporting**
- **Level 4. Business Integration**

Size and depth of gray slices indicate the number and type of services offered by the organization

Core Manifest Clearing Functions





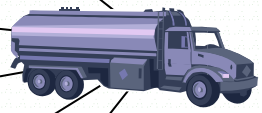
Generator

Access Registered Manifest

Create Manifest Record

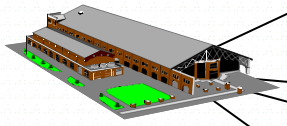
Update Manifest Record

Certify



Transporter

Update Manifest Record



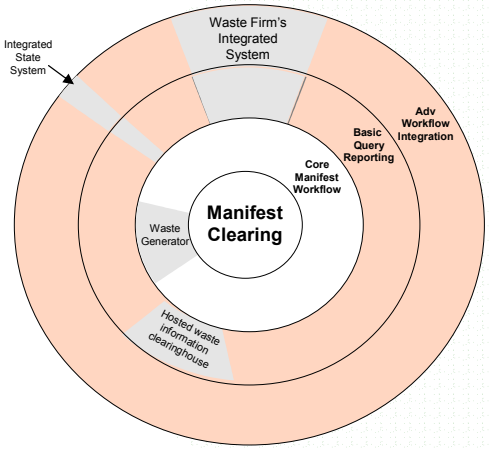
Receiving Facility (TSDF)

Create Discrepancy Report

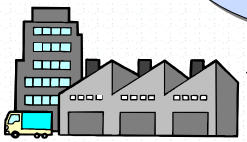
Certify

Notify Generator and State Regulatory Body

Value-Added e-Manifest Functions



Query: Waste Available to Transport



Waste Brokerage

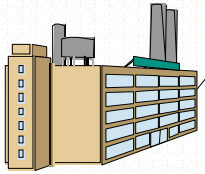
Academic

Query: Manifest Data for Trends Analysis

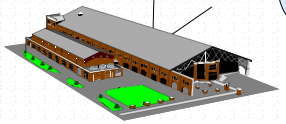
Query: All Manifest Received by Facility for Timeframe

EPA & State

Generate Invoice/Payment

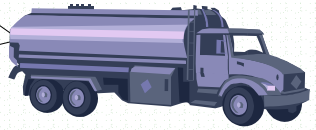


Generator



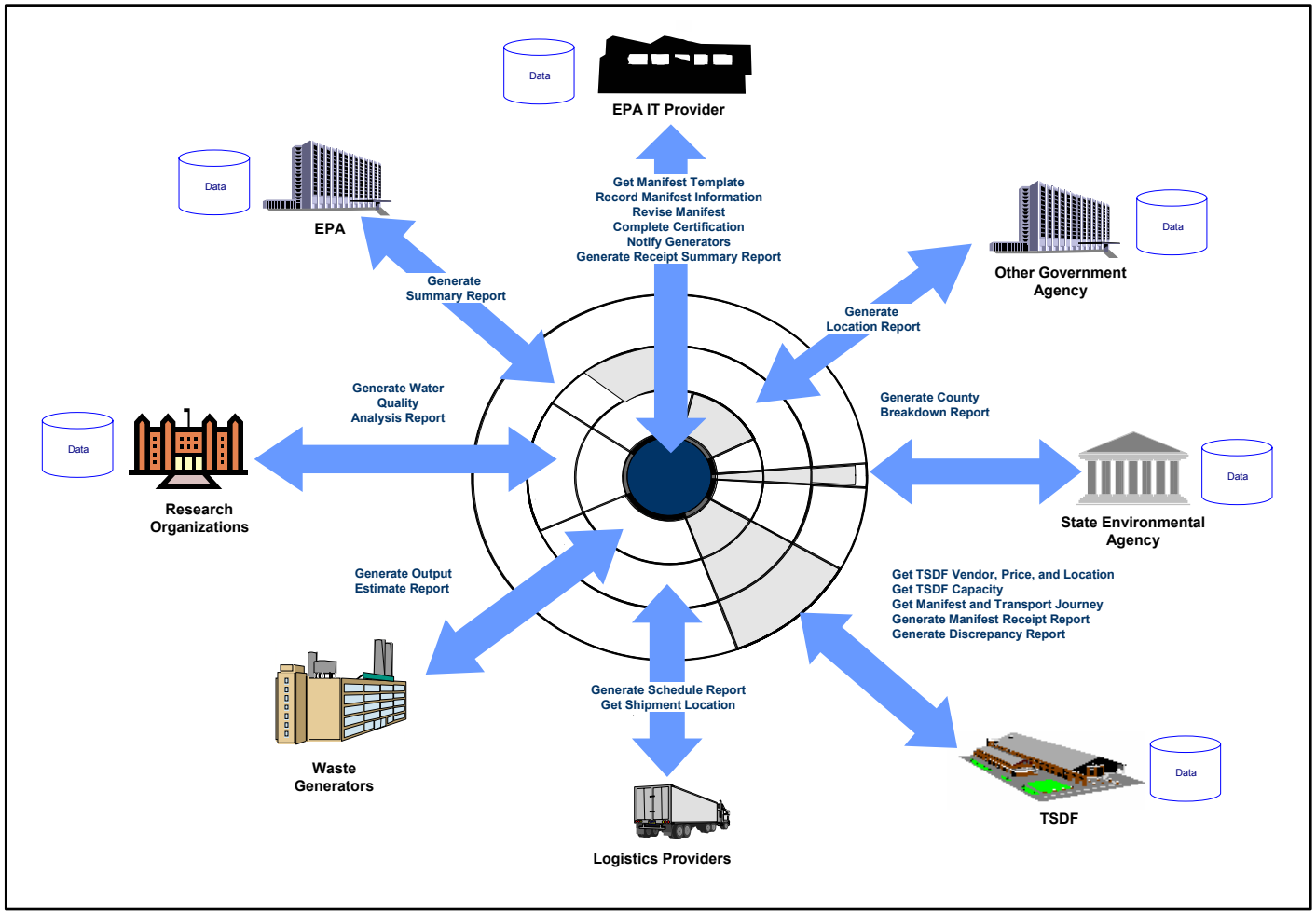
Receiving Facility (TSDF)

Confirm Transporter Fee Schedule



Transporter

e-Manifest Straw Approach



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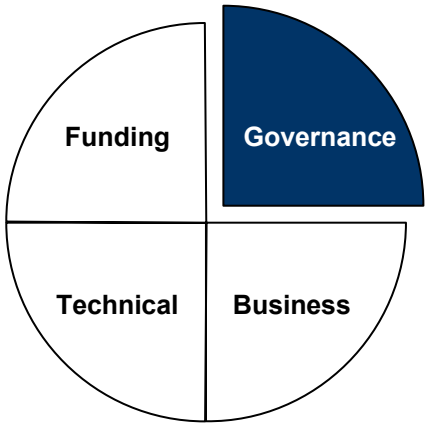
- **Ensures manifest integrity, security, and non-repudiation with low complexity**
- **Encourages stakeholder participation in provisioning services and publishing data**

Opportunities for Reusing EPA IT Infrastructure

- Leverage Exchange Network to Host e-Manifest Services
  - Mature Web-based deployment
  - Mature security and transaction model
  - Partner interfaces rely on open technology standards, a common functional specification, and Trading Partner Agreements (TPAs)
- Leverage Emerging EPA Portal
  - Web Forms-based access to leverage manifest services
  - Ease of integration with other apps via portal framework
  - Facilitate “Single Sign On” and integration with EPA ID Management Model
- Employ a Business Process Management Approach to Ensure Reliability of Key Business Processes

Governance of Shared Services Approach

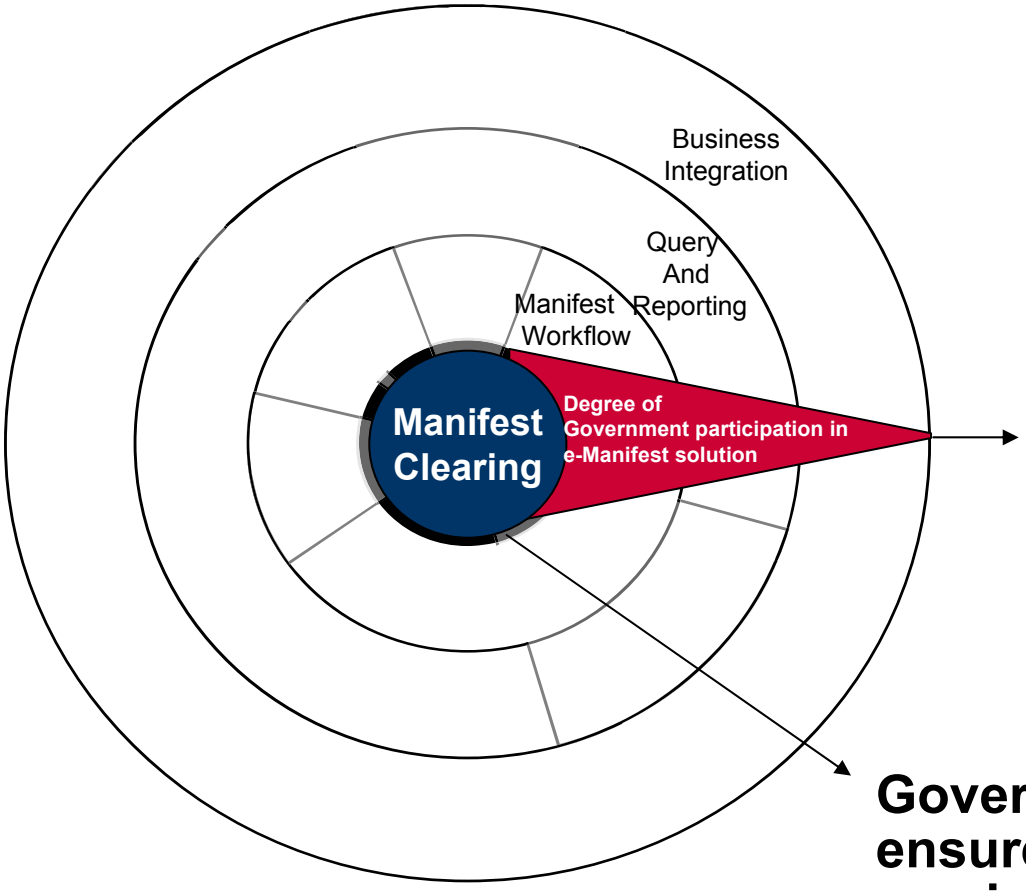
- What agreements and/or rules are needed
  to make this approach work?
- How are they developed?
- How are they enforced?



Two Phases of Governance

- First: Design and Implementation of Core Services
  - What process/structure ensures that the services designed will work for you?
  - Key issues
    - Core data interchange format
    - Core service interface
    - Funding processes
- Second: Administration of Core Services
  - How are the services operated/administered?
    - Quality of service of the core - How do we ensure it is reliable to business and to Government?
    - Ensuring no partner's use of the services degrades, corrupts, or misrepresents core services

The Government Part of Governance Focuses on the Core

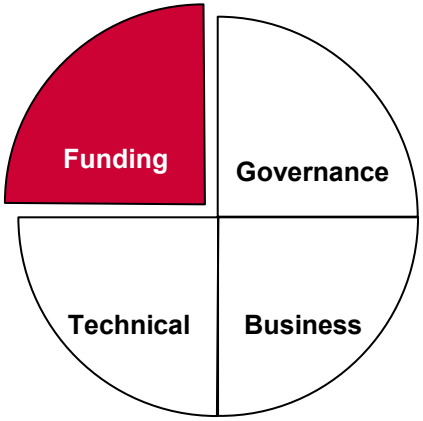


Private sector partners manage their business - governance, of course, would not mandate how end-user services are provided

Government ensures core services—tracking, non-repudiation, custody chain

Funding Approaches

- **Funding approaches will show alternatives for funding the e-Manifest system build and ongoing operations**
  - **User fees**
  - **Share-in-savings (EPA or private-sector funded)**
  - **New appropriation to EPA**
  - **Other grant programs**
  - **Private sector sponsorships**
  - **Non-Governmental Organizations**
  - **Electronic Government Fund**



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